

REMARKS

Claims 1-20 are pending. Claims 12-17 and 20 are withdrawn from consideration. By this amendment, claims 1, 6, 8-9, and 11 are amended, and claims 21-25 are added.

Reconsideration of the application is respectfully requested in view of the above amendments and the following remarks. For the Examiner's convenience, Applicant's remarks are presented in the order in which they were raised in the Office Action.

A. Claim Objections

Claims 9 and 11 are objected to for not complying with the requirements of 37 CFR 1.821. The claims have been amended to identify the claimed sequences by the respective SEQ ID Nos in accordance with 37 CFR 1.821-1.825. No new matter is added by these amendments. Withdrawal of this ground for objection is respectfully requested.

B. Objections to the Specification

The specification has been objected to for not complying with the requirements of 37 CFR 1.821. The specification has been amended to identify the nucleic acid and amino acid sequences by their respective SEQ ID Nos in accordance with 37 CFR 1.821-1.825.

The Brief Description of the Drawings section has been amended to match the drawing identifiers with the drawings.

No new matter is added by these amendments. Withdrawal of these grounds for objection is respectfully requested.

C. Claim Rejections under 35 U.S.C. § 112

(i) Claims 1-11 and 18-19 are rejected under 35 U.S.C. § 112, first paragraph, because the specification, while being enabling for treatment of an infection by a microorganism, allegedly does not reasonably provide enablement for prophylaxis of an infection by a microorganism.

While Applicants do not agree with the Examiner that prophylaxis of an infection by a microorganism is not enabled, Applicants amend claim to delete the term "prophylaxis" solely for

the purpose of expediting prosecution. Cancellation of the subject matter of the claims is not to be construed as acquiescence to the grounds of objection or a dedication to the public and Application reserve the right to pursue claims to the cancelled subject matter in a continuation or divisional application.

In light of the deletion of the term "prophylaxis" from claim 1, this ground for rejection of claims 1-11 and 18-19 is moot.

(ii) Claim 9 is objected for lack of sufficient disclosure about the conditions for hybridization under "low stringency conditions."

In response, claim 9 has been amended to recite "low stringency conditions comprising from at least about 0 to at least about 15% v/v formamide and from at least about 1M to at least about 2M salt." Support for the amendment is found on page 27, lines 3-4 of the specification. Further, Applicants submit that page 27, lines 3-24 provide sufficient and specific disclosure of the parameters required for achieving "low stringency conditions." Withdrawal of these grounds for objection is respectfully requested.

(iii) Claims 1-11, 18 and 19 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Applicants respectfully traverse. A person skilled in the relevant art would immediately know what is an HA-2 containing protein as HA-2 domains were well characterized prior to the filing date of the application. In support, Applicants attach the reference De Carlo et al., (1999) *Porphyrin-mediated binding to a hemoglobin by the HA2 domain of cysteine proteinases (gingipains) and hemagglutinins from the periodontal pathogen prophyromonas gingivalis. Journal of Bacteriology* 181(12):3784-3791. In addition, the definition of HA2 on pages 16 and 17 of the specification further define the HA-2 domain. Withdrawal of these grounds for objection is respectfully requested.

(iv) The Examiner objects to the terms "for a time" and "sufficient" to antagonize the interaction between a HA-2 domain-containing molecule from a microorganism and a HA-2 binding motif on a porphyrin as specified in claim 1.

Applicants respectfully traverse. The term "antagonize" is defined on page 23, lines 8-14 of the specification, as well the functional result of such antagonism. Antagonism is stated to be determined by "binding assays or inhibition of *P. gingivalis* growth or maintenance." Methods of screening for antagonists are described on pages 29-30 of the specification. Example 7 (pages 39-40) describes a solid phase ligand binding assay. Figures 4a-4b (Example 15) describe inhibition of hemin or hemoglobin binding in terms of IC₅₀ values. Example 20 (page 45) discloses control of *P. gingivalis* growth. Applicants submit that one of skill in the art would readily understand the duration (time) and conditions of incubation required to achieve the defined levels of antagonism from the description and numerous examples in the specification. Withdrawal of these grounds for objection is respectfully requested.

(v) The Examiner objects to the use of the term "related organism" in claim 2 alleging that it is not explained in the specification. Applicants respectfully traverse. The specification at page 15, line 31 – page 16, line provide a definition including several examples of microorganisms that are considered to be "related to" *P. gingivalis* in the context of the present invention. Withdrawal of these grounds for objection is respectfully requested.

(vi) The Examiner finds claims 6, 8-9 and 11 to be indefinite in view of the limitation following the phrase "such as."

In response, Applicants amend claims 6, 8-9 and 11 to delete the limitations following the phrase "such as." Applicants add new claims 21-25, which depend from claims 6, 8-9 and 11 respectively, which specify the original limitations following the phrase "such as" as further limitations in the dependent claims. No new matter is added by the new claims.

Applicants submit that this ground for rejection is moot in light of these amendments to claims 6, 8-9 and 11. Applicants further submit that new claims 21-25 are not indefinite. Withdrawal of these grounds for objection is respectfully requested.

D. Claim Rejections Under 35 U.S.C. § 103

Claims 1-7, 9-11, 18-19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Potempa et al. in view of Progulske-Fox and Nakayama et al.

Applicants respectfully traverse and submit that these documents do not specifically mention or suggest or even allude to the inhibition of interaction between a hemagglutinin peptide and binding motif of a porphyrin molecule.

The Examiner alleges that Potempa et al. teach that their invention provides for methods of protecting a mammal from periodontitis caused by *P. gingivalis* by administering an immunogenic composition comprising of at least one hemagglutinin peptide. Further, the Examiner alleges that Progulske-Fox et al. teach a method of detecting the presence of disease causing *P. gingivalis*, disclosing polypeptides which can be used for the production of antibodies associated with disease. Further, the Examiner also alleges that Progulske-Fox et al teach that *P. gingivalis* hemagglutinin protein was expressed in non-virulent *Salmonella typhimurium* strain and tested for activity as a competitive inhibitor of hemagglutination. The Examiner goes on to allege that although Potempa et al. do not teach that the interaction between a hemagglutinin peptide and a hemagglutinin motif on a porphyrin molecule is antagonized and although Progulski et al. do not teach that the hemagglutinin molecule is HA-2, Nakayama et al. teach that the hemagglutinin molecule is HA-2 and thus the invention would allegedly be obvious to one of ordinary skill in the art.

Applicants do not agree as Potempa et al. in view of Progulske-Fox et al. and Nakayama et al. do not teach a method that "antagonize[s] the interaction between a molecule ... having an HA2 domain and an HA2-binding motif on a porphyrin containing molecule ..." as specified in claim 1.

While the references highlight the role of the hemagglutinin peptide in pathogenesis, none of these citations specifically reveal the actual mechanism of interaction between hemagglutinin protein and a molecule such as heme nor teach or suggest a method based on inhibition of such interaction. The claimed invention specifically targets the antagonist to disrupt a specific interaction between HA-2 and the hemagglutinin motif on a porphyrin molecule. The present invention claims a method based on antagonising the interaction between a specific "HA2 domain and an HA2-binding motif

on a porphyrin containing molecule." Methods for identifying antagonists of these specific domains of interacting proteins would not be obvious to one skilled in the art in light of these citations.

Since Potempa et al., Progulske-Fox and Nakayama et al. by themselves or in combination do not teach or suggest each and every element of the invention, Applicants respectfully request that this ground for rejection be withdrawn.

CONCLUSION

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to withdraw the outstanding rejection of the claims and to pass this application to issue. If it is determined that a telephone conference would expedite the prosecution of this application, the Examiner is invited to telephone the undersigned at the number given below.

In the event the U.S. Patent and Trademark office determines that an extension and/or other relief is required, applicant petitions for any required relief including extensions of time and authorizes the Commissioner to charge the cost of such petitions and/or other fees due in connection with the filing of this document to Deposit Account No. 03-1952 referencing docket no. 229752001500. However, the Commissioner is not authorized to charge the cost of the issue fee to the Deposit Account.

Dated: September 21, 2005

Respectfully submitted,

By Shantanu Basu
Shantanu Basu

Registration No.: 43,318
MORRISON & FOERSTER LLP
755 Page Mill Road
Palo Alto, California 94304-1018
(650) 813-5995